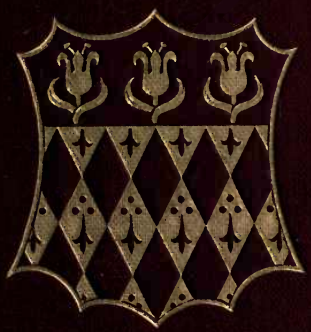

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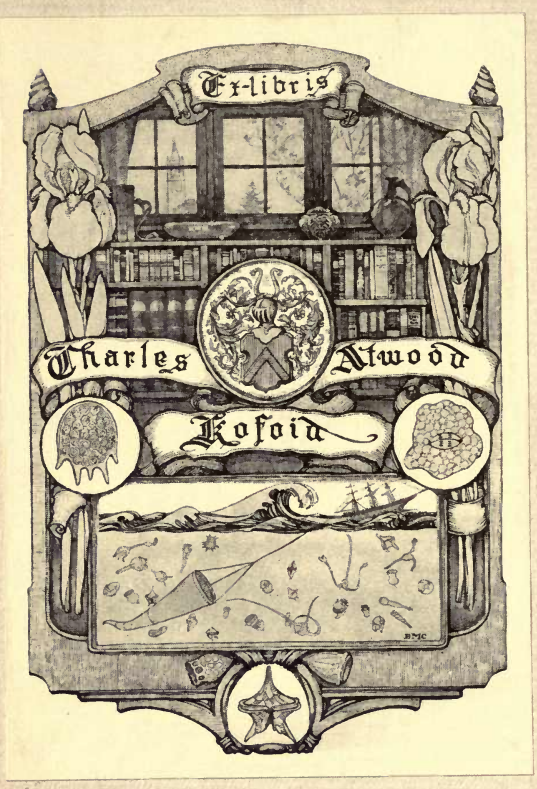

OXFORD : HORACE HART
PRINTER TO THE UNIVERSITY

CATALOGUE

OF THE

PHILOSOPHICAL APPARATUS, MINERALS, GEOLOGICAL SPECIMENS, &c.

IN THE POSSESSION OF

DR. DAUBENY,

PRÆLECTOR OF NATURAL PHILOSOPHY IN MAGDALEN COLLEGE,

AND NOW DEPOSITED IN THE BUILDING CONTIGUOUS TO THE BOTANIC GARDENS, BELONGING TO THAT SOCIETY.

OXFORD:

PRINTED BY JAMES WRIGHT.

MDCCCLXI.

CATALOGUE

OF

PHILOSOPHICAL APPARATUS, &c.

TELESCOPE BUILDING.

An achromatic telescope by Cooke, with an object glass $5\frac{1}{4}$ inches in diameter.

[The mounting is of the equatorial kind, with tangent screw motions, with right ascension and declination.]

Box containing six eye-pieces and transparent prism reflector for looking at the sun.

Dewcap.

Smyth's cycle of celestial objects.

Nautical Almanac, and Dietrichsen's ditto from 1858.

Six maps of the stars.

Astronomical observations by Professor Piazzi Smyth.

LECTURE ROOM.

CABINET I.—Voltaic Electricity.

Voltaic pile, and Couronne des tasses.

Cruickshank's battery.

Wollaston's battery.

Daniell's original constant battery. Improved ditto. Dissected ditto.

Grove's battery (64 cells.)

Smee's ditto.

Bunsen's charcoal ditto.

CABINET II.

Gas jars, with tubes to show how plants under the influence of light absorb carbonic acid gas and give off oxygen.

Two bell glasses, large enough to inclose a plant of considerable size.

CABINETS III. and IV.—Voltaic Electricity.

(Upper Compartment.)

Vessels to exhibit the electric light, and other articles of apparatus connected with Voltaic electricity.

(Lower Compartment.)

Six glass jars of different colours.

Six bottles set in wood. Two glass boxes let into copper.

And other articles for experiments on the action of light on plants.

CABINET V.

(Upper Compartment.)

Circular Voltaic battery.

Apparatus for decomposing water and salts by Voltaic electricity. (several kinds.)

(Lower Compartment.)

Electrotyping apparatus, &c.

CABINET VI.

(Upper Compartment.)

Shelf 1. Pneumatics.

Apparatus connected with the air-pump.

Small air-pump.

Shelf 2. Apparatus for evaporating in vacuo, several kinds.

Syringes, &c.

Shelf 3. Hydrostatics.

Specific gravity bottle in tin case. Two ditto in wooden case, and one with thermometer attached.

Three hydrometers in tin cases, and one smaller in a leathern case.

Spirit measures.

Apparatus to show by experiment the principle on which the mode of ascertaining the specific gravity of solids depends.

SHELF 4. LIGHT.

One prism.

Coloured glasses to exhibit the passage of light through coloured media.

(Lower Compartment.)

Photographic apparatus, with specimens of drawings.

Heliostate.

CABINET VII.—LIGHT.

(Upper Compartment.)

SHELF 1. Jordan's heliograph.

Herschel's actinometer.

SHELF 2. Biot's apparatus for testing liquids by polarized light.

Window of selenite illustrating the polarizations of light.

Burning mirror.

SHELF 3. Camera for photography, and various apparatus for ditto.

(Lower Compartment.)

Various apparatus connected with polarized light and photography.

CABINET VIII.—HEAT.

(Upper Compartment.)

SHELF 1. Three large thermometers with coloured liquid.

Actinometer, by Cumming and others.

Five barometer tubes, immersed in mercury, to show the tension of vapours.

Wollaston's cryophorus, several.

One barometer gauge, to screw into steam engine.

SHELF 2. Tubes showing the relative expansion by heat of water, alcohol, and mercury.

Apparatus showing expansion of metals by heat.

Rutherford's registering thermometer.

Daniell's pyrometer.

Apparatus to regulate the supply of gas to burners.

(Lower Compartment.)

Parabolic mirrors for radiation.

Apparatus for freezing without ice, and salts for ditto.

CABINET IX.—Heat.

(Upper Compartment.)

Shelf 1. Papin's digester.
Differential thermometers.
Brass globe, to illustrate the pressure of steam.
Shelf 2. Hygrometers: Saussure's, Daniell's, Mason's, Connell's.
Shelf 3. Breguet's thermometer.
Air thermometer.
Flask and tube, showing the expansion of water under 40°.
Apparatus for showing the relative conductibility of solids.

(Lower Compartment.)

Various rude articles of apparatus, to illustrate the phænomena of heat.

CABINET X.—Inorganic Chemistry.

(Upper Compartment.)

Shelf 1. Attraction, models of crystals.
Solutions of Glauber salt for crystallizing.
Shelf 2. Atmospheric air.
Globe for burning phosphorus in oxygen.
Papers for testing for ozone, and apparatus for preparing it.
Shelf 3. Hydrogen, apparatus for showing Drummond's light.
Spirit lamp and platina coil.
Shelf 4. Two Dobereiner's lamps.
One Cavendish apparatus for exploding gases.
One bottle for exploding hydrogen and oxygen.
Diffusion apparatus, two kinds.

(Lower Compartment.)

Brewster's apparatus for obtaining homogeneous light.
Various other articles connected with the preceding subjects.

CABINET XI.—Inorganic Chemistry.

(Upper Compartment.)

Shelf 1. Nitrogen.
Gun cotton. Nitrous acid. Indigo.
Shelf 2. Carbon with Nitrogen.
Hydrocyanic acid and tests for ditto.

SHELF 3. CARBON WITH HYDROGEN.

Fusel oil. Petroleum. Condensed liquor from coal tar. Etherine from oil gas. Naphthaline.

Two of Davy's original safety lamps.

One improved ditto.

SHELF 4. CARBON WITH OXYGEN.

Liquid carbonic acid.

Four Hope's eudiometers.

Apparatus for showing the absorption of gases by charcoal.

Stenhouse's respirator.

SHELF 5. SULPHUR.

Apparatus for uniting NO_4 with SO_2.

Bisulphuret of carbon.

Sulphur in various conditions.

Sulphuric acid anhydrous.

Apparatus for generating sulphuretted hydrogen.

(Lower Compartment.)

Model of the Grotto del Cane.

Copper jars for gases.

CABINET XII.—INORGANIC CHEMISTRY.

(Upper Compartment.)

SHELF 1. PHOSPHORUS.

Amorphous and common.

Glacial PO_5, and solution of ditto.

Phosphide of calcium.

SHELF 2. BORON.

Boracic acid and borate of soda.

SHELF 3. CHLORINE.

Apparatus for preparing chloride of nitrogen.

Ditto for chlorine.

Wolfe's apparatus for absorbing H Cl.

SHELF 4. IODINE.

Iodine. Vapour of ditto in flask. Leamington water with ditto.

Bent tubes for generating hydriodic acid.

SHELF 5. BROMINE, and sundry compounds of ditto.

SHELF 6. FLUORINE, apparatus for generating ditto.

(Lower Compartment.)

Bottles with narrow necks for Bromine.
Apparatus for etching with H Fl.

CABINET XIII.—Inorganic Chemistry.

(Upper Compartment.)

Shelf 1. Potassa.
Barilla, and other salts of potash.
Lithia, salts of. Spodumene.
Apparatus for filtering caustic alkalies.
Ditto for burning K in CO_2.
Ditto for producing K.
Alkalimetry. Bottles for this purpose. Alkalimeter.
Nitre from the walls of the old Museum.

Shelf 2. Soda.
Model of graduation apparatus used in Savoy.
Rock salt. (Various specimens) including the explosive kind from Wielitska.
Sodium. Soda and several of its salts.
Ammonia and its salts.
Apparatus for collecting carbonate of ammonia.
Volcanic sal ammoniac.

Shelf 3. Lime.
Stalactites, (various.)
Casts of various objects in Travertine from Tuscany.
Davy's apparatus for estimating CO_2. Fresenius' ditto.
Apparatus for Clarke's soap test.

Shelf 4. Sulphate of lime, crystallized and amorphous.
Phosphate of lime, (mineral) various kinds. Coprolites, &c.

CABINET XIV.—Inorganic Chemistry.

Shelf 1. Baryta, Strontia, and Magnesia.
Various salts of these earths:—Witherite — Strontianite — Dolomite, &c.

Shelf 2. Glucina and Yttria. Alumina.
Dying materials, various.
Alum shale in various stages of decomposition.

Alum in crystals. Crystal of chrome alum. Ammonia alum. Volcanic alum.

SHELF 3. Series of specimens illustrating the manufacture of pottery.
Aluminium in bar, and in wire, also forming weights.
Chloride of aluminium.
Corundum, Pipeclay.

SHELF 4. SILICA.
Series of specimens used in the manufacture of glass, and specimens of glass variously coloured, &c.
Artificial ultramarine. Sodalite.
Soluble silica. Ransome's artificial stone. Wood silicified.
Asbestos.

CABINET XV.—INORGANIC CHEMISTRY.

A.

SHELF 1. ARSENIC.
Apparatus for detecting arsenic, and reduction tubes.

SHELF 2. SELENIUM.
Various specimens of earths containing selenium.
TELLURIUM. Metal in several forms.

SHELF 3. BISMUTH.
Fusible metal and mould for casting ditto.
Bismuth, metallic, and salts of ditto.
ANTIMONY, ores of.
Ditto, salts and preparations of.
Typemetal.

SHELF 4. MANGANESE, salts of.
Ditto, dendrites produced by.
COBALT, salts of.
Ditto, glass coloured by.
CHROME, salts of.
Chromic acid, showing a different colour by reflected and transmitted light.

CABINET XV.—INORGANIC CHEMISTRY.

B.

SHELF 1. TUNGSTEN—LANTANIUM—COLUMBIUM—CERIUM—TITANIUM—URANIUM—MOLYBDENUM.
Salts of the above metals.

Shelf 2. Cadmium.
Metallic cadmium, and sublimate containing it.
Zinc, oxide of. Calamine, common and electric.
Shelf 3. Tin.
Tinfoil. Ores of tin. Powdered tin. Salts of ditto.
Shelf 4. Lead. Ores of lead, and salts of ditto.

CABINET XVI.—Inorganic Chemistry.

A.

Shelf 1. Iron.
Specimens of iron ore.
Cast iron protectors with excess of carbon, after long exposure to sea-water.
Cast iron tubes after long exposure to water containing CO_2 at the Hot Wells, Clifton.
Steel formed by passing CH through ironwire.
Shelf 2. Iron.
Its salts.
Steel made by Bessemer's process.
Coin and bird coated with peroxide of iron from the hot spring of Loueche in Switzerland.
Scotch pigiron.
Iron made by Ransom's process.
Meteoric stones.
Ores of iron (various).
Cube of iron pyrites.
Shelf 4. Nickel.
Salts and ores of nickel.
Mercury, salts of.
Flask with long neck for producing red oxide of mercury.

CABINET XVI.—Inorganic Chemistry.

B.

Shelf 1. Copper, Ores of.
Specimens illustrating the reduction of copper at Swansea.
Shelf 2. Salts of Copper (various.)
Lamp to show the union of Copper and Sulphur.
Tube for reducing copper by hydrogen.

SHELF 3. PLATINUM. IRIDIUM. RHODIUM. PALLADIUM. OSMIUM.
Platinum, spongy and crude.
Ammonio—chloride of.

SHELF 4. SILVER AND GOLD.
Buttons of silver.
Ditto of gold.
Touchstone.
Cupells.

CABINET XVII. and XVIII.

Complete suite of apparatus for organic analysis.

CABINET XIX.

Apparatus for showing endosmose and exosmose.

CABINET XX. XXI.—ORGANIC CHEMISTRY.

Products derived from the vegetable kingdom.

CABINET XXII. XXIII.—ORGANIC CHEMISTRY.

Products derived from the animal kingdom.

CABINET XXIV.—COMMON OR STATIC ELECTRICITY.

(Compartments A and B.)

Two electrical machines.
Pithball electrometer.
Gold leaf ditto.
Universal discharger.
Electric needle.
Quadrant electroscope.
Unit jar.
Leyden jars, (various.)
Electrophorus.

CABINET XXIV.—Electromagmetism.

Compartment C.

Thermomultiplier.
Two Galvanometers.
Compound antimony and bismuth bars.
Ruhmkorff's induction coil.
Two vacuum tubes for ditto.
Model of Electric Telegraph.
Rotating wires.
———— magnet.
———— wheel.
Horseshoe and bar magnets.
Nobili's apparatus for obtaining sparks from a magnet.
Dipping needle.
Delarive's floating apparatus.
Wires showing the divergence of a magnetic needle by the influence of an electric current.
Rotating cylinder.
Horseshoe bar of soft iron convertible into a temporary magnet.

CUPBOARDS FOR APPARATUS.

No. 1 to 8. Bottles, jars, retorts, receivers, flasks, mattrasses, crucibles, and other miscellaneous articles.
No. 9. Large glass receivers, two Liebig condensers, mercurial trough, gas furnace with pumice stone to retain the heat.

APPARATUS ROOM.

One standard thermometer by Welsh.
Twenty-four common ditto.
Three scales of chemical equivalents.
One portable mountain barometer.
One furnace for making potassium.
Stone filter for purifying water.
Apparatus for drawing up water from great depths.

LABORATORY.

FIVE SERIES OF BOTTLES.

First series, acids.
Second ditto, alkalies and their salts.
Third ditto, earths and their salts.
Fourth ditto, metals and their salts.
Fifth ditto, miscellaneous chemicals.
Two sets of bottles containing tests.

Two mortars, glass, four Wedgwood, one porphyry, one agate, and three steel of various sizes.
Eight measuring glasses.
Four dripping bottles.
Two glass spirit lamps, and others.

One air pump.
Seven jars for ditto.
Sundry other apparatus connected with ditto.

DRAWERS CONTAINING;
Wooden cubes for illustrating atomic weight.
Tubes for organic analysis.
Filtering paper, &c.

Table blowpipe.
Weighing table, and weighing machine.
One large and one small pair of scales.
One large and one small platinum balance.
Sets of weights from 56lb to $\frac{1}{10}$ of a grain.
Series of French weights or grammes, and parts of ditto.

Fifty air jars of various sizes from 10 cubic inches to 1000 ditto.
Three gallon bottles with stoppers.
Ten stands with rings for supporting retorts.
Sixty gas tubes.
A large scale of chemical equivalents.
A large stock of funnels and lipped glasses.
Four burettes for dropping measured portions of liquids.

Two glass syphons.
Three furnaces of the old construction.
One fire clay furnace.
One gas furnace by Griffin.
A double bellows for ditto.

Copper water bath, for drying precipitates.
Copper still and worm.
Iron bottle for distilling mercury.

Two small pneumatic troughs.
One large ditto.
Five copper gasholders.
Two large gasometers for containing a supply of hydrogen and oxygen.
Copper vessel for generating hydrogen.
Mercurial trough with 230lb of mercury.

Ten platina dishes and crucibles under two ounces.
Four above two ounces with eleven lids.
One platina still.
One large platina dish weighing eleven ounces.
Two spatulas of platina.
Two stirring rods of ditto.
Five silver dishes.

Eight day timepiece.
A barometer.

MINERAL COLLECTION.

APPARATUS ROOM.

Arranged after the chemical system of Rammelsberg, "Handwörterbuch des chemischen Thiels der Mineralogie, Berlin 1841."

In 77 drawers under the following heads:

A.—Inflammable minerals.

B.—Earths not combined with silica.

C.—Minerals consisting of silica, either alone or in combination with water.

D.—Silica in combination with bases.

E.—Silicates with salts of other acids.

F.—Silicious minerals of indefinite composition.

G.—Metallic ores.

A.—Inflammable minerals.

Drawers 1 to 4.—*Examples:* Sulphur, graphite, amber.

B.—Earths not in combination with silica.

1. Lime and its salts.

Drawers 5 to 17.—*Examples:* Calc spar, gypsum, apatite.

2. Magnesia and its salts.

Drawer 18.—*Examples*. Dolomite, meerschaum, magnesite.

3. Strontian and its salts.

Drawer 19.—*Examples:* Celestine, strontianite.

4. Barytes and its salts.

Drawer 20.—*Examples:* Heavy spar, witherite.

5. Alumina and its salts.

Drawer 21.—*Examples:* Wavellite, corundum, cryolite.

C.—Minerals in which Silica stands alone, or is only combined with water.

Drawers 22 to 28.—*Examples:* Rock crystals, agates, opals.

D.—Silica in combination with bases.

1. A with a single base isomorphous with lime (S1O, RO.)

Drawers 29, 30, 31.—*Examples;* Serpentine, asbestos, talc.

2. Silica with a single base isomorphous with alumina (S1O, R2 O3.)

Drawers 32, 33.—*Examples:* Cyanite, chiastolite.

3. Silica with several bases isomorphous with lime (S1O with several RO.)

I.—Without water.

Drawer 32, 33, 34.—*Examples:* Augite, olivine, hornblende.

II.—With water.

Drawer 35.—*Examples:* Schiller spar, apophyllite, tremolite.

4. Silica with several bases isomorphous with alumina (S1O, with several R2 O3.)

Drawer 36.—*Examples:* Beryl, bole, grenatite.

5. Silica with several bases, some isomorphous with lime, or RO; others with Alumina, or R2 O3.

I.—Without water.

Drawers, 37, 38, 39, 40, 41.—*Examples:* Felspar, leucite, garnet.

II.—With water.

Drawers 41, 42, 43, 44, 45, 46.—*Examples:* Zeolites.

E.—Silicates with salts of other acids.

Drawers 47, 48.—As with sulphates, *Example:* hauyne;
——————— with chlorides, ——— sodalite;
——————— with fluorides, ——— topaz;
——————— with borates, ——— tourmaline.

F.—Minerals siliceous, but indefinite in their chemical composition.

Drawer 49.—*Examples:* Pumice, pitchstone, obsidian.

G.—Metallic ores.

Drawer 50.—Ores of arsenic, selenium, bismuth.

Drawer 51.—Ores of antimony.

Drawer 52.—Ores of manganese.

Drawer 53.—Ores of cobalt.

Drawer 54.—Ores of uranium and molybdenum.

Drawer 55.—Ores of tungsten, titanium, cerium and columbium.

Drawers 56, 57.—Ores of zinc and cadmium.

Drawers 58, 59.—Ores of tin.

Drawers 60, 61, 62, 63.—Ores of lead.

Drawers 64, 65, 66, 67, 68, 69.—Ores of iron.

Drawer 70.—Ores of nickel.

Drawers 71, 72, 73, 74.—Ores of copper.

Drawer 75.—Ores of mercury.

Drawer 76.—Ores of silver.

Drawer 77.—Ores of gold, platinum, &c.

GEOLOGICAL SPECIMENS

IN PRIVATE ROOM.

First part, Stratified rocks of all ages, in 140 drawers.

Second part, Plutonic and Metamorphic rocks, in 34 drawers.

Third part, Volcanic rocks, submarine and subaerial, in 126 drawers.

Fourth part, miscellaneous collection, consisting of suites of specimens illustrating the geological structure of particular districts.

A containing 77 drawers.

B containing 38 ditto.

PART I.

Stratified rocks of all ages.

Drawer 1.—Cambrian rocks from North Wales.
The lowest in S. Britain, destitute of fossils.

Drawer 2.—Bala limestones, ditto.
Nearly the lowest of the rock formations, and rarely fossiliferous.

Drawer 3.—Llandilo flags, ditto.
With many kinds of trilobites.

Drawer 4.—Caradoc sandstone, ditto.
Full of Silurian fossils, especially Pentamerus, Leptæna, &c.

Drawer 5.—The same—South Wales.
Stiper-stone, and volcanic or trap rocks, accompanying.

Drawer 6.—Wenlock limestone, Dudley.
With trilobites, corals, and other characteristic fossils.

Drawer 7.—Wenlock limestone and shale, ditto.
With corals, and many other fossils.

Drawer 8.—Ludlow rocks, Presteign, South Wales.
Aymestry limestone, ditto.
With various fossils.

Drawer 9.—Ditto with orthoceratites, Ludlow.
Ditto with fossil fish, and sundry characteristic fossils, Ledbury.

Drawer 10.—Chiastolite Slate, destitute of organic remains, belonging to the Cambrian series, Skiddaw, Cumberland.

Drawer 11.—Slate containing Graphite, Borrowdale; and Limestone of Coniston.

Drawer 12.—Silurian rocks with tubiporites, madreporites, &c. Lilleshall, Shropshire.

Drawer 13.—Slates, Serpentines, &c. Cornwall.

Drawer 14.—Slates and Sandstones, underlying the Devonian system; from the Gap of Dunloe, Killarney.

Drawer 15.—Silurian limestones from Connemara.

Containing traces of Phosphoric Acid, mostly crystalline, and associated with noble Serpentine (verd antique). The following is the composition of a few of these specimens.

No.	Locality.	Insoluble matter per cent.	Phosphoric Acid per cent.	Remarks.
1	Letterdean, near Clifden.	17.0	a trace	
2	Ditto.	30.0	0.67	
3	Coolecroy, near Clifden.	30.0	0.68	
4	Knockbane between Kingstown and Streamstown bay, near Clifden.	6.0	1.20	
5	Letternosh, near Clifden.	33.0	2.40	
6	Leesonter, near the Recess Inn.	45.0	1.90	50 per cent. of Magnesia.
7	Barnanorrery, near Ballinahynch.	50.0	0.28	
8	Glencoaghan, near ditto.	13.1	2.60	trace of Copper.
9	Ditto, near ditto.	90.1	a trace	

The presence in these rocks of Phosphoric Acid is interesting, as showing, that the high degree of metamorphic action which they must have undergone in order to convert them into the crystalline condition in which they appear, has not disengaged their Phosphoric Acid; tending therefore to prove, that this substance, if once introduced into a rock from any source, will remain undissipated, whatever heat the material may afterwards undergo.

Drawer 16.—Silurian Slates from the border country of Scotland, Fassney Burn, East Lothian; with Granite, or Sienitic Greenstone, intruding into it in Dykes.

Described in the Wernerian Transactions, vol. I. by Dr. Ogilvie, under the name of Greywacke Slate.

Drawer 17.—Silurian rocks from the North and East of Scotland—Stonehaven, Aberdeenshire—Lochaber, Banffshire.

Drawer 18.—Silurian rocks from Oban, West of Scotland.

Drawer 19.—Silurian slates with Orthoceratites from the lake of Silgau in Dalecarnia, Sweden.

Drawer 20.

Drawer 21.

N. B. The above drawers contain specimens from the oldest stratified rocks known in Great Britain; those from the bottom of the series, such as the Bangor and Skiddaw slates, being destitute of organic remains, and according to my experiments, detailed in the seventh vol. of the Journal of the Chemical Society, devoid also of Phosphoric Acid. If this be the case, it is impossible that any organic remains can ever have existed in the formation, for we know of no animal or plant from the constituents of which Phosphoric Acid is entirely absent. Hence such rocks may be regarded as *Azoic*, or deposited where no organic beings existed.

The Lingula, of which specimens occur in Drawer 9, is at once the oldest fossil known, and the one that has extended through the greatest number of formations, having existed alike in the Silurian and in the present eras, and in both cases with scarcely any difference in form or structure; a fact often alleged in discredit of Mr. Darwin's theory as to the production of new species by natural selection.

The best authorities to be consulted are Murchison's Silurian System, and Sedgwick's various papers, especially that in the British Association Report for 1853.

DEVONIAN ROCKS, INCLUDING THE OLD RED SANDSTONE.

Drawer 22.—Slates and limestones with Cyathophylla and various fossils, from the neighbourhood of Plymouth and Exeter. Beekites† from the triassic Conglomerate, containing fragments and rolled masses of Devonian limestone, near Torquay.

Drawer 23.—Polished specimens of fossil sponges, orthoceratites, and corals from the Devonian limestones, near Torquay.

Drawer 24.—Corals from ditto, also polished.

Drawer 25 and 26.—Old red sandstone with fossil fish, Cromarty, Scotland.

[For these rocks consult Hugh Miller's work, entitled Old Red Sandstone.]

† Beekite is the name given to a variety of Chalcedony which forms in tubercles, or in spheroidal concretions upon some fossil present in the limestone, which constitutes a nucleus round which the siliceous matter has collected. See a paper by Mr. Pengilly, read before the Geol. Section of the British Association at Cheltenham, 1856.

Carboniferous system.

Including the mountain limestone, coal shale, and other associated rocks.

Drawers 27 and 28.—Mountain, or Carboniferous limestone, with Encrinites, Corallines, &c., Derbyshire.

Drawer 29.—Limestone of Devonshire with its most characteristic shells, (purchased at Dr. Buckland's sale) mostly named.

Drawer 30 and 31.—Carboniferous limestone with shells, Bristol.

Drawer 32.—Coal formation from the Forest of Dean.

Drawer 33.—Coal plants, Shropshire.

Drawer 34.—Series of fossils from the Carboniferous limestone of Yorkshire. Named by Mr. Charlwood.

Drawer 35.—Ironstone from Staffordshire.
Septaria (called beetlestones), Tenby.

Drawer 36.—Teeth of Sauroid fishes from the coal formation of Gilmerton near Edinburgh.

Drawer 37.—Rocks belonging to the coal formation, principally sandstone and grit, Edinburgh.

Drawer 38.—Rocks belonging to the coal formation of the Isle of Arran.

Drawer 39.—Corals and shells from the Carboniferous limestone. Various parts of Ireland.

Drawer 40.—Coal formation of the Vivarais, near Aubenas, France.

Drawer 41.—Limestone which abounds in caverns, Adelsberg, Carinthia.
Polierschiefer, and other pseudo-volcanic rocks. Bohemia.

Drawer 42.

For these rocks, consult Phillips' Manual of Geology. They present the earliest known records of the existence of tracts of dry land, in the impressions of ferns, of palms, and of other terrestial plants, of which the coal seems to be made up; witnesses at once of a more genial climate, and of the prevalence of islands, rather than of extensive continents. But the carboniferous limestone, within which the coal beds lie, bears evidence, in its corals, shells, &c. of a submarine origin. See also Phillips' Geology of Yorkshire.

DIVISION B.

PERMIAN SYSTEM.

Drawer 1.—Specimens illustrating the singularly jagged structure of the surface, and other peculiarities, of the dolomitic rocks at Bolsover, Derbyshire.

This rock, in consequence of its supposed durability, was selected as the material for the Houses of Parliament, but the material quarried has not answered the expectations formed of it, decaying rapidly in the atmosphere of London.

Drawer 2.—Singular botryoidal concretions in the Magnesian Limestone of Sunderland, Durham.

Drawer 3.—Magnesian limestone of Durham with organic remains.

Some specimens are fissile and flexible.

Drawer 4.—Magnesian limestone from Germany, and Hungary.

Drawer 5.

Drawer 6.

MESOZOIC SYSTEM.

MUSCHELKALK, NEW RED SANDSTONE, &c.

Drawer 7.—Muschelkalk of Germany, viz. from Brunswick, Cassel, Bareuth, &c.

Drawer 8.—Muschelkalk with its characteristic shells, from Aarau, and Solothurn, Switzerland.

This rock does not exist in England, but most of the saline deposits on the Continent are situated in it.

Drawer 9.—Salt formation of Bex, Switzerland, with the limestone that accompanies it, and the same from Hallein, Tyrol.

Drawer 10.—New red sandstone, with cobalt imbedded, from Cheshire; and containing gypsum and sundry fossils, from Derbyshire.

Drawer 11.—Do. with gypsum, from the neighbourhood of Bristol and Belfast.

LIAS, OOLITE, AND JURA LIMESTONE.

Drawer 12.—Casts of the impressions of the Cheirotherium, or Hand-animal.
Supposed by Professor Owen (Palæontology) to have been produced by a Batrachian animal, called by him Labyrinthodon.

Drawer 13 and 14.—Lias fossils, chiefly Ammonites, from Dorsetshire.
Mostly polished specimens, bought at Dr. Buckland's sale.

These curious Cephalopodes seem to have been first brought into existence at this period, as they do not occur in the more antient rocks. They abound throughout the Oolitic and Cretaceous strata, but were extinct in the Tertiary period, and do not occur in the present seas. See Phillips' work, entitled "Life on the Earth," 1860. p. 102.

Drawer 15.—Lias with organic remains. Westbury upon Severn.

Drawer 16.—The same from Gloucestershire.
Containing, amongst other fossils, Avicula longicostata.

Drawers 17, 18.—The same from Dorsetshire.
Comprising the head of Ichthyosaurus communis, the ink bag of the Sepia, as well as the entire animal, together with fossil wood, Gryphites, and other fossils, such as Ammonites, vertebræ of Ichthyosauri, and numerous Coprolites.

A more complete series of the latter is to be seen in the Sherard Room, under the glass case containing specimens of Phosphate of Lime. For Dr. Buckland's paper, in which he proved that these concretions were the fæces of extinct animals, see the Geological Transactions, vol. III. new series.

Drawer 19.—The same from Whitby in Yorkshire, comprising Ammonites, Belemnites, Coprolites, and other fossils.

Drawer 20.—Rocks from the Isle of Sky, some of them referred to the Lias.

Drawer 21.—Slates belonging to the Lias period, with impressions of fish, insects, cololites, &c., Solenhofen, Bavaria; and shells from the Jura limestone, Germany.

Drawer 22.—Lias fossils from the neighbourhood of Moscow.

Drawer 23.—Inferior oolite from the neighbourhood of Bristol, with its characteristic fossils.

Drawers 24, 25.—Ditto from Sherborne, Dorsetshire, including Ophiocoma Egertoni.

Drawer 26.—Oolite comprising Caryophylla and other corallines, Plagiostoma, and other bivalves, Wiltshire.

Drawers 27, 28, 29.—Stonesfield slate with its characteristic fossils.
Such as Sharksteeth, bones of the Pterodactyl, and sundry bivalves.

N. B. This is the oldest rock in which have been discovered Mammalian remains, viz. those of Marsupial animals, belonging to the Opossum tribe.

Drawer 30.—Kelloway rock in the Oolite from Wiltshire.
Including the Pear Encrinite of Bradford, Ostreæ, and other bivalves.

Drawers 31, 32.—Kelloway rock and Bath Oolite. Scarborough, Yorkshire, with impressions of ferns, and sundry shells.

Drawers 33, 34, 35.—Oolitic rocks with their characteristic fossils, chiefly from the coral rag and calcareous grit. Oxfordshire.

Drawer 36.—Oxford clay, containing Ammonites and Belemnites with their siphunculus preserved, and sundry other fossils from the neighbourhood of Chippenham.

Drawer 37.—Portland beds with impressions of worm castings, Isle of Portland.

Drawer 38.—Portland and Purbeck beds, Dorsetshire. Insect bed, with impressions of insects, Swanage. Kimmeridge clay, and dirt bed, Isle of Portland.
See Buckland, Geol. Trans. vol. II. p. 395.

Drawer 39.—Kimmeridge clay, from Kimmeridge near Weymouth, and Whitecliff, where a few years ago occurred the fire, which was magnified by the neighbourhood into a Volcano, but which arose merely from a spontaneous combustion of iron pyrites extending to the bituminous clays in its vicinity. Also the shells and bituminous coal of this locality, and amongst the specimens of the latter, the *coal money* §.

Drawer 40.—Vegetable impressions in sandstone, from Brora, Sutherlandshire.

Drawer 41.—Jura Limestone, Switzerland, chiefly from Solothurn.

Drawer 42.—Fossils from Switzerland, chiefly from the Jura Limestone.

For the Oolite, so far as it is developed in England, Conybeare and Phillips' Geology of England and Wales is still perhaps the best guide that can be consulted.

§ The name of coal-money is given to small discs of shale, which have apparently been shaped in a lathe; and are supposed to have been used either as coins or amulets by the ancient inhabitants.

DIVISION C.

Drawers 1, 2, 3.—Suite of fossil shells from the Oolite, various localities.

Drawer 4.

Drawer 5.

Drawer 6.

GREEN SAND AND CRETACEOUS STRATA.

Drawer 7.—Iron sand full of sponges, Faringdon.

Drawer 8.—Iron sand, from Faringdon, and from Shotover Hill, near Oxford.

Drawer 9.—Fossils chiefly belonging to the Gault, from Mr. Charlwood.

Drawer 10.—Green sand, iron sand, and Wealden clay. Endogenites from the Tilgate forest beds. (Mantell.)

Drawer 11.—Green sand with its characteristic fossils. Melbury, Dorsetshire, and Blackdown, Devon.

Drawer 12.—Phosphatic nodules from the Green sand. Farnham, Surrey. Swindon, Folkstone, &c.
See a Paper by Messrs. Paine and Way, Royal Agric. Journal.

Drawer 13.—Green sand with fossils. Isle of Wight.

Drawer 14.—Green sand series upwards to the chalk. Isle of Wight.

Drawers 15 and 16.—Chalk with flints, containing Alcyonia, Echini, &c. Sussex, chiefly from Midhurst.

Drawer 17.—Chalk with its characteristic fossils, chiefly from Hampshire.

Drawer 18.—Chalk chiefly from the neighbourhood of Belfast and the Giant's Causeway.
Shewing its conversion into Marble where in proximity to Trap.

Drawer 19.—Chalk with imbedded fossils. Various localities.

Drawer 20.—Chalk from Maestricht.

Drawer 21.—Chalk called by the Italians Scaglia, from Schio, Vicentin.

Drawer 22.—Chalk fossils from Gosau, in Austria.

Regarded as intermediate between the Cretaceous and Tertiary rocks.

See Murchison and Sedgwick's paper in the Transactions of the Geological Society.

Drawer 23.—Lower Cretaceous beds. Montagne de Fizs, Alps of Savoy near Chamouni, with Ammonites and other fossils.

See Studer, Geologie der Schweiz, vol. II. p. 91.

Drawer 24.

Tertiary or Cainozoic system.

Divided by Lyell into

Eocene, containing only about 5 per cent. of existing species of shells.

Meiocene, containing not more than 20 per cent. of living species.

Pleiocene, containing more than 20 per cent. of living species, but a few that are extinct.

Pleistocene, none but existing species.

In my arrangement I have not attempted to distinguish these several orders, but have merely placed together the tertiary deposits of each country, as those of Italy, Sicily, England, France, Germany, Switzerland, and Cuba.

Drawer 25.—Shells in a kind of volcanic tuff, Ronca, Vicentin.

Drawer 26.—Fossil fish, &c., Monte Bolca, Vicentin, and Cape Orlando, near Naples.

Drawer 27.—Gypsum, and other rocks, with tertiary shells, Volterra, &c., Tuscany.

Drawers 28, 29, 30.—Shells with the containing rock, chiefly belonging to the pleistocene period, although capping the lofty hill of Castrogiovanni, the ancient Enna, in the centre of the Island of Sicily.

See my memoir on the geology of Sicily, Edinb. Phil. Journal.

Drawer 31.—Coralline crag, or lower Pleiocene rock, with its shells.

Partly fresh water, partly marine, Orford, &c.; also red crag, or middle Pleiocene, Walton, Suffolk, containing a series of shells and other fossils from these strata.

Drawer 32.—Red crag ditto continued, and specimens from Sheppy.

Drawer 33.—Series of the Phosphatic nodules, found in the crag at Felixstow, near Ipswich.

N. B. A larger series may be consulted in the Sherard room.

Drawer 34.—* Whales' ears, sharks' teeth, vertebræ of fish, tortoises, &c. from the Crag, Suffolk.

Drawer 35.—Bones and other fossils from the same formation, Suffolk.

Drawer 36.—Upper and lower freshwater formation, from Headon Hill, Alum Bay, and impressions of leaves from the Bagshot clay. Corfe, Dorsetshire.

Drawer 37.—Plastic clay and other beds associated with it, from the Isle of Wight.

Drawer 38.—Large series of shells, mostly named by Mr. Charlsworth, from Barton and Hordwell cliffs; and also from the Isle of Wight.

Drawer 39.—Tertiary rocks with their shells, from various localities in the South of England.

Drawer 40.—Fossil fish, from the Tertiary rocks of Aix in Provence.

Drawer 41.—Freshwater formation from the neighbourhood of Clermont in Auvergne, France.

Drawer 42.—Freshwater formation from Aurillac in Cantal, Puy en Velay, and various other parts of France.

Drawer 43, 44.—Specimens from the Basin of Paris.

Consisting of the following rocks. 1. Chalk. 2. Plastic clay. 3. Calcaire Grossier. 4. Siliceous limestone. 5. Gypsum. 6. Lower freshwater. 7. Sand and gritstone without shells. 8. Sand and upper marine gritstone. 9. Millstone without shells.

Drawers 45, 46.—Shells in the Tertiary rocks of the Basin of Paris.

Drawer 47.—Shells from the Tertiary rocks, near Bordeaux.

* A vast number of these bones, the most indestructible parts of the whales' skeleton, are accumulated in this stratum at Felixstow near Ipswich, and, together with the sharks' teeth which are found in the same locality, supply abundant evidence, that the Phosphatic nodules there met with may have been derived from the decomposition of animal matter. I believe these fossil tympana are the earliest records we have of the existence of the whale in our seas.

Drawer 48.—Tertiary rocks with sulphur, Radeboy, Croatia; and salt formation, Wielitzka, Poland.

Drawer 49.—Tertiary rocks near Buda, Hungary, and from certain parts of Germany.

Drawer 50.—Shells from Tertiary rocks, Basins of Vienna, Bavaria, and Wirtemburg.

Drawer 51.—Shells from the Vienna Basin.

See Murchison and Sedgwick's Geological Transactions.

Drawer 52.—Brown coal from the Tertiary rocks of the Wetterau.

Containing impressions of the leaves of the vine, with fossil seeds, amongst which are those of a grape, curious as shewing that a species of vine was indigenous at that period in this northern latitude.

Drawer 53.—Nagelflue and other Tertiaries, from Berne, and Œningen, Switzerland.

Drawer 54.—Do. from Zurich, St. Gingulph, Switzerland, and from various places in the Tyrol.

Drawers 55, 56.—Specimens illustrative of the recent coralline rocks, forming raised beaches on the North coast of the Island of Cuba.

Collected by myself in 1838.

PART II.

PLUTONIC AND METAMORPHIC ROCKS.

Including those produced by igneous action, such as Granite, Syenite, &c.; and also those so affected by the influence of heat, as to be entirely destitute of fossils, such as Gneiss, Mica slate, Clay slate, Quartz rock, &c.; differing therefore from the Azoic strata exhibited in the last series, inasmuch as they supply evident marks of such metamorphic action, as might have obliterated any traces of organic structure once present in theim. Several metalliferous rocks, as those of Cornwall, Dalicarnia, and Styria, are also comprehended in this division.

Drawer 1.—Large and small grained granite, gneiss, and rocks associated with the two, Aberdeenshire.

Drawer 2.—Metamorphic rocks, quartz, greenstone, and conglomerate, associated with granite. Aberdeenshire.

Drawer 3.—Serpentine, graphic granite, and mica slate, from Portsoy, Banffshire.

Drawer 4.—Tale-slate, hornblende-slate, &c. Portsoy, Banffshire.

Drawer 5.—Granite containing carbonate of strontian, heavy-spar, and galena. Strontian, Argyleshire.

Drawer 6.—Granite and porphyry from various parts of Scotland.

Drawer 7.—Porphyries from Glenco, Argyleshire.

Drawer 8.—Mica and hornblende slates, with granite, from the base and slopes of Ben Nevis, Argyleshire.

Drawer 9.—Granite, syenite, and porphyry, with dykes of pitchstone; and mica slate with veins of granite. Isle of Arran.

Drawers 10, 11.—Limestone, associated with primary rocks containing tremolite, and specimens of the granitic veins of Glen Tilt near Blair in Athol.

See Macculloch's Geol. Trans. vol. iii. p. 259. and new series vol. i. for a description of these veins, so often appealed to as proofs of the Huttonian Theory.

Drawer 12.—Veins of granite. in Gneiss and other so called primary rocks, Garvemore, Invernessshire,
Limestone singularly curved, and subordinate to mica slate, Lismore, Argyleshire.

Drawer 13.—Mica slate, potstone, &c. Inverary.

Drawer 14.—Mica slates from various parts of Scotland.

Drawer 15.—Clay slates from various parts of Scotland.

Drawer 16.—Clay slate from Balahulish, Argyleshire.

Drawer 17.—Quartz rock containing rutile, associated with which is mica and hornblende slate. Craig Cailleach, near Killin, Perthshire.

Drawer 18.—Quartz rock containing blende, galena, and other minerals, from Clifton mine, Tyndrum.

Drawer 19.—Series of rocks from granite to old red sandstone, Banks of the North Esk river, Forfarshire.

Drawer 20.—Plutonic and metamorphic rocks. Iona, Skye, Tiree, Oronsay, in the Hebrides.

Drawer 21.—Sandstones and conglomerates associated with granites, Beauly, Rossshire, Callendar Perthshire.

Drawer 22.—Sandstones passing into granite. Invermorrison, Invernessshire.

Drawer 23.—Sandstones and conglomerates, near the Fall of Fyers, Invernessshire.

Drawer 24.—Granitic rocks with specimens of graniteveins, and of China clay derived from the decomposition of granite. Devonshire and Cornwall.

Drawer 25.—Suite of rocks including saussurite, diallage rock, and serpentine, from the Lizard, Cornwall.

See Sedgwick's paper in the Camb. Philosophical Transactions for 1821.

Drawer 26.—Clay slate and killas, Cornwall.

Drawer 27.—Elvan* and granite dykes, Cornwall.

Drawer 28.—Veinstones and accompanying minerals, from Dolcoath and other mines, Cornwall.

Drawer 29.—Miscellaneous specimens from Cornwall, and other localities.

Drawer 30.—Lead ores containing silver, Sala, Sweden.

Drawer 31.—Specimens from the mines of Fahlun, Dalecarnia, including cerite, fahlunite, and several specimens of copper pyrites.

Drawer 32.—A large suite of magnetic iron ores from the mines of Danemora, Sweden.

Drawer 33.—Sparry Iron ore from Eisenerz in Styria, with the accompanying rocks and minerals.

Including the Flos Ferri, occurring between Gneiss and fossiliferous limestone, (See Boue's Germany) which contains from 50 to 79 per cent of Carbonate of Iron.

Drawer 34.—Mineral veins from Schlackenwald, Bohemia, including Apatite, Phosphorite, Uranite, Specular Iron ore, &c.

* Elvan is a Cornish term for a species of compact Felspar or Eurite occurring in dykes.

PART III.

VOLCANIC ROCKS.

Or products of Volcanos ejected either under water, or in the air.

I. Products of submarine volcanos.

Trap rocks, either stony-looking and compact, or, if vesicular, having their interstices filled up with crystalline matter.

Drawer 1.—Dykes of Greenstone and Amygdaloid, Berkeley, Gloucestershire.
Traversing the old red sandstone and coralline limestone, and altering their character.

Drawers 2 and 3.—Toadstones, or Amygdaloidal Traps, traversing Carboniferous limestone. Bakewell, Derbyshire.

Drawer 4.—Trap rocks from Bamborough, Northumberland.

County of Antrim.

Drawer 5.—Basaltic rocks from the Giant's Causeway.

Drawer 6.—Trap rocks associated with chalk. Various localities on the coast.

Drawer 7 and 8.—Trap dykes and rocks affected by their contact.
Viz. chalk converted into compact limestone, and shale into flinty slate, the latter still retaining the impressions of Ammonites. Portrush and other places in the same county.

Drawer 9.—Chiefly rocks altered by igneous action.

Drawers 10 and 11.—Porphyries from Sandy Brae.
Resembling those of Hungary, in Drawer 72, and containing zeolites.

For a description of these classical spots, see particularly Berger on the Geological Features of the North Eastern counties of Ireland, with an Introduction and Remarks by the Revd. W. Conybeare, and descriptive notes referring to an outline of Sections of the same coast, by Messrs. Conybeare and Buckland, in the Geological Transactions, vol. III.

Near Edinburgh.

Drawers 12, 13.—Trap which appears to alternate with limestone and other Neptunian rocks on the coast of Fifeshire, opposite Edinburgh.

Drawer 14.—Basalt and Trap Tuff. Arthur's Seat.

This well-known rock is an intimate mixture of a zeolitic mineral and of magnetic iron ore, both of which are soluble in Hydrochloric Acid; and of Augite, which is insoluble in that menstruum. Water is always present.

Drawer 15.—Various Trap rocks. Calton Hill, Edinburgh.

Drawers 16 and 17.—Suite of specimens from Salisbury Crags, Edinburgh.
Shewing the sandstone near its contact with Trap, in various stages of alteration, and also in its unaltered condition.

The localities from which the specimens in this and the four preceding drawers are taken, were of old the scenes of many fierce contentions at Edinburgh, between the favourers of the Neptunian and Huttonian theories; some of these places, as Calton Hill, appearing to favour the former, others, as Arthur's Seat and Salisbury crags, to support the latter hypothesis.

Drawers 18 and 19.—Suite of rocks consisting of clinkstone*, clay porphyry, and slates, from the Pentland Hills, Edinburgh.

Drawer 20.—Suite of specimens from near Stirling Castle.
Illustrating the changes brought about in these rocks by the Basalt.

See Macculloch, in the Geological Transactions, vol. III. p. 305.

Drawer 21.—Trap rocks. Dumbartonshire and Fifeshire.

Drawer 22.—Trap rocks from various parts of Scotland.

Isle of Arran.

Drawer 23.—Pitchstones. Cory Gills.

Drawer 24.—Pitchstones. Lamlash Island, near Arran.

Drawers 25 and 26.—Trap dykes of various kinds, including Pitchstone, Arran.

Drawers 27 and 28.—Clay porphyry and other rocks associated with it, Lamlash Island, near Arran.

For the geology of Arran, Jameson's Geological Travels, and Ramsay's later work may be consulted.

* A rock composed, according to Gmelin, of glassy Felspar and a Zeolitic mineral.

HEBRIDES.

Drawer 29.—Basalt, Pitchstone, &c. Mull, Staffa, Rum.

Drawers 30 and 31.—Pitchstone and other Trap rocks. Isle of Egg.

Drawers 32, 33, 34.—Hypersthene rock, and other varieties of Trap, containing Zeolites, from the island of Skye.

Together with a geological map of the island.

See Macculloch, Geological Transactions, vol. III. For the Geology of the Hebrides generally, Macculloch's Western Islands is the best authority.

Drawer 35.—Trap rocks from the Faroe Islands.

Presented by sir W. Trevelyan.

Garnets and Analcime, Anglesea, &c., from professor Henslow.

See Henslow's paper in Transactions of the Cambridge Philosophical Society.

Drawer 36.—Syenitic rocks, Malvern, Herefordshire; Mount Sorrel, Northamptonshire.

See Phillips in the Memoirs of the Geological Survey of Great Btitain.

Drawers 37, 38.—Porphyry associated with sandstone. Chemnitz, Saxony.

Drawer 39.

Drawer 40.

II. PRODUCTS OF SUB-AEREAL VOLCANOS.

Generally more or less cellular, although distinguishable into stony and vitreous, according either to the greater or less slowness with which they cooled, or to the chemical composition of the material itself. When cellular, crystalline matter rarely fills up its cavities, as in submarine volcanic rocks.

AUVERGNE.

Drawer 41.—Lavas of Volvic, Graveneire, Puy de la Vache, and Puy Pariou.

Also basalt of Gergovia, near Clermont, Auvergne.

Drawer 42.—Domite, a variety of Trachyte, from Puy de Dome, &c., near Clermont.

N. B. Trachyte is essentially a felspathic rock, consisting however of those varieties of the felspathic family, which contain the largest amount of Silicic acid, in proportion to that of the bases with which it is combined, so that it approaches more nearly to granite than ordinary lavas do.

From Abich's Geol. Beob. it appears, that the rock is made up principally of glassy Felspar, and of Albite, both which minerals possess the same composition, so far as regards the proportion of Silica to Base, though differing in the nature of the Base present; in both of them 1 atom of Potassa, or some equivalent base, being combined with 1 atom of Silica; and 1 atom of Alumina, or of some equivalent base, being united with 3 of Silica; its composition admitting of being represented by the following formula:

$$RO, Si O_3 + R_2 O_3, 3 Si O_3.$$

With these minerals variable proportions of quartz are usually intermixed, as is the case with granite, but generally in smaller quantities than in the latter. See the first chapter of my Descriptions of Volcanos.

Drawer 43.—Volcanic rocks associated with the Tertiary formation of the plain of Limagne, near Clermont.

Drawers 44, 45.—Antient volcanic rocks, chiefly Trachytic, including deposits from the Thermal waters of St. Nectaire, and of Mont Dor.

N. B. I have distinguished these lavas into antient and modern, according as they are intersected by the valleys of the country, or follow their slope; the former being antecedent, the latter subsequent, to the formation of the valleys in which they occur.

Drawer 46.—Antient volcanic rocks, near Clermont.

Drawers 47, 48.—Antient volcanic rocks, Cantal.

Drawer 49.—Modern volcanic rocks, including compact as well as scoriaceous varieties, Puy en Velay.

Drawer 50.—Modern volcanic rocks from the Vivarais.
Clinkstone and other ancient ones, Mount Mezen.
For a description of these rocks see a memoir of mine published in the Edinburgh Philosophical Journal for 1820—1821, and likewise my Description of active and extinct Volcanos p. 22.

N. B. The latter work is referred to in subsequent parts of the Catalogue under the title of "Volcanos." On the geology of central France Mr. Scrope's memoir may also be consulted with advantage. The panoramic views which accompany that volume are particularly instructive.

GERMANY.

Drawer 51.—Modern volcanic rocks, Eyfel.

Including cellular and scoriaceous lava, together with the fossiliferous limestone which accompanies it, some of which is dolomitic, and yet contains shells, trilobites, corals, &c.

Drawer 52.—Modern volcanic rocks, including compact and cellular lava. Gmünden lake, Eyfel.

Trass or volcanic tuff, from Bruhl, with wood imbedded. Loose masses of Augite rock from the crater of Daun.

Drawers 53, 54.—Modern volcanic rocks from Bertrich, Lake of Laach, and Andernach. Millstone of Niedermennig with imbedded minerals, such as Hauyne, Spinell, &c.

Drawer 55.—Ancient volcanic rocks, including trachyte and basalt from the Siebengebirge and other localities near Bonn.

Vide Horner, Geological Transactions, vol. iv. p. 433, new series.

Drawer 56.—Ancient volcanic rocks consisting of cellular and compact Trap, Trachyte from the Westerwald, and also from Oberstein near Kreutznach.

This latter locality contains many curious agates, for which see the Mineral Collection.

Drawer 57.—Ancient volcanic rocks consisting of cellular and compact Trap, with the semiopal they contain, from Hanau, and Bochenheim, near Frankfort, &c.

Drawer 58.—Ancient volcanic rocks, consisting of compact and cellular Trap. Vogelsgebirge, Hessia.

Drawer 59.—Trap rocks intruding themselves through sandstone, and altering it in structure and hardness. Budingen and other places near Eisenach, Hessia.

Amongst the changes induced, is that from sandstone of the common kind into a hard and compact variety, crystallized (so to

speak) in prisms resembling the little columns produced by artificial heat in the same material at Rotherham, Yorkshire. In the same drawer by way of comparison are placed specimens of the columnar sandstone of Bradford, Yorkshire.

Drawer 60.—Trap rocks, many highly cellular. Blaue Kuppe near Eschwege, Meisner, &c. Hessia.

Drawer 61.—Volcanic rocks from Rhöngebirge, Hessia.

The hill called Pferdekopf from which the specimens are taken has been represented as a crater. Some specimens are highly scoriaceous.

Drawer 62.—Clinkstone and other rocks associated with it, containing natrolite, from Hohentweil, and other localities near Constance.

Drawer 63.—Trap rocks, including clinkstone and basalt. Toeplitz, Bohemia.

Drawer 64.—Suite of specimens from the modern volcanos of Kammerburg near Egra in Bohemia, consisting of scoriæ and cellular lavas.

Drawers 65, 66.—Specimens illustrative of the amygdaloidal clinkstone formation of Kaiserstuhl near Brisgau on the Rhine, including Hyalite, Chalcedony, and sundry Zeolites.

N. B. See, for the contents of Drawers 51—66, "Volcanos," p. 70, et seq.

Drawers 67, 68.—Tertiary rocks with nummulites and other shells, through which the trachyte of Gleichenburg near Gratz in Styria has protruded.

Alternating with scoriaceous and cellular volcanic rocks, the latter with nodules of olivine.

Volcanos p. 186, et seq.

Drawer 69.

HUNGARY.

Drawer 70.—Greenstone porphyry of Beudant, associated with primary rocks, and passing into Sienite.

Drawer 71.—Trachyte and trachytic porphyry* of Beudant.

* Distinguished from trachyte by the general absence of scoriform substances, of hornblende, augite, and titaniferous iron, and by the abundance of quartz present in it.

Drawer 72.—Pearlstone† of Beudant.

Drawer 73.—Millstone porphyry § and trachytic conglomerate of Beudant.

Drawer 74.—Suite of trachytic rocks, Glasshutte and Hodritz.

Drawer 75.—Trachyte, sundry varieties, near Pesth.

Drawer 76.—Mineral veins in trachytic and other porphyries, Schemnitz.

Of the volcanos of Hungary, Beudant's Voyage, 3 vols. 4to., is the most complete account, My own Work, ch. v. contains a short abstract of his Report, together with observations of my own.

Drawer 77.

Drawer 78.

Drawer 79.—Dolomites attributed to volcanic action, with the porphyries accompanying them. Val di Fassa, Tyrol.

Drawer 80.—Minerals from the Val di Fassa. Limestone rock converted into Dolomite by volcanic action ‖. Lake Lugano.

ITALY.

Drawer 81.—Rocks connected with the volcanos of the Vicentin, Schio. Named by the Abbe Maraschini.

See Volcanos, p. 143.

Drawer 82.—Trap dykes and cellular lavas near Schio, Vicentin.

Drawer 83.—Trachytes and cellular lavas, Euganean Hills near Padua.

Drawer 84.—Cellular volcanic rocks associated with tertiary rocks. Monteccio Maggiore, Vicentin.

† A form of trachyte made up of little granules with a pearly lustre, richer in Silica than either trachytic porphyry, obsidian, or pumice, and containing more water in its composition.

§ A very quartzous form of trachyte, much employed for millstones from its harsh, gritty, porous character.

‖ On this curious question see "Volcanos," p. 150, or the original memoir of Von Buch in Ann. des Soc. Nat. 1827, also De La Beche's Views of Geological phenomena.

Drawer 85.—Volcanic Tuff with limestone alternating with it. Val de Nera &c., Vicentin.

Both containing tertiary shells, of which however the greater part are in Drawer 36 part I. C.

N. B. Volcanic Tuff is generally defined as an agglutination of fragments of scoriæ and loose materials ejected from a volcano, but in reality it appears to be a more homogeneous material than the above description would lead us to infer. Abich states, that the volcanic Tuff of Vesuvius resembles in its composition Pumice, only that whilst the latter contains only one atom of water, white tuff contains 2, and yellow tuff 3 atoms. Palagonite is the name for a kind of tuff met with in Sicily and Iceland. (Vid. infra, p. 40.)

Drawer 86. Volcanic Tuff with shells of limestone alternating with it, Braganza near Bassano.

For the contents of Drawers 81—86, see Volcanos, ch. viii.

Drawer 87.—Volcanic rocks of central Italy near Radicofani, Acquapendente, and Viterbo. Including columnar trachyte, full of crystals of Leucite.

See Volcanos, ch. ix. p. 151.

Drawer 88.—Suite of specimens illustrating the rock called Peperino.

This material occurs on the Alban Hills and other places in the neighbourhood of Rome, and exhibits the various changes which the volcanic tuff has undergone, as well as the minerals and fragments of other rocks which are imbedded in it, so as to form a kind of Breccia.

What is remarkable is that loose incoherent Tuff lies both above and below this rock near Marino.

See a notice of a Paper read on that subject at the meeting of the British Association at Aberdeen, by myself, in the report of do. for 1859, p. 102.

Drawer 89.—Volcanic Tuff from the neighbourhood of Rome.

Two kinds, viz. granular and lithoide, rolled pebbles occur in it.

Drawer 90.—Basaltiform currents of lava from the neighbourhood of Rome.

Showing (1) the rocks at the Capo di Bove, where the supposed current terminates. (2) Those nine miles from Rome, on the Appian Road, which seem a continuation of the same current. (3) The second branch of the same current near Vallerano. (4) Similar rock from the ridge bounding the lake of Albano, and from Marino. (5) Leucitic lava of M. Cavo at Hannibal's camp. (6) Sperone, a peculiar kind of tuff near Tusculum.

See Supplement to "Volcanos," p. 815.

Drawer 91.—(1) Marl with marine shells, near Rome.
(2) Trachyte of Tolfa near Civita Vecchia.
Showing the various stages of its decomposition, and the production thereby of alumstone, from which the famous Roman alum was manufactured.
See Supplement to "Volcanos," p. 814.

Drawers 92, 93, 94.—Volcanic Tuff of Rocca Monfina, an extinct volcano between Rome and Naples, together with the Trachyte which forms its summit.
The tuff from the side of the mountain contains various blocks imbedded and large crystals of leucite.
Its composition is

$$3KO, 2Si\,O_3 + 3\,(Al_2\,O_3, 2Si\,O_3).$$

It is very rare at Vesuvius.
See "Volcanos" chap. x. and a memoir of mine in the Transactions of the Ashmolean Society.

Drawer 95.

Drawer 96.—Volcanic Tuff of various kinds including the rock called Piperno, from the neighbourhood of Naples.
See notice of a Paper read by me to the British Association, in the Volume of Reports for 1859, p, 102.

Drawer 97.—Do. chiefly from Pompeii, Herculaneum, Nola, with Obsidian and Pumice imbedded.
N. B. It may be remarked, that Obsidian and Pumice are not ejected by the volcano at the present time.

Drawer 98.—Volcanic Tuff from the Fossa grande Vesuvius, St. Rocca, and other places near Naples.
Containing shells similar to those of the Mediterranean at present. This is one argument employed in favour of the elevation of the mountain from the bed of the Mediterranean at some former epoch.

Drawer 99.—Volcanic Tuff called Puzzolana from the neighbourhood of Naples.

Drawer 100.—Tuff and other rocks from Lake Agnano, Monte Nuovo, Astroni, &c. near Naples.

Drawer 101.—Specimens from the Solfatara.
Shewing the trachytic current of Mount Olibano, and the trachyte of

the crater in its unaltered and altered condition, together with the various sublimations found in it, such as sulphur, alum, and Sal Ammoniac. The presence of Sal Ammoniac in this crater presents a difficulty in the way of Bunsen's mode of explaining its occurrence in lavas, as he would make it depend upon the existence of organic matter at the spot where it was generated. See for a more probable explanation "Volcanos," supplement, p. 812.

This is an example of trachyte emitted from a volcano as a current, a somewhat rare occurrence, for, as might be expected from its approaching nearer in composition to granite than ordinary lavas, it more generally forms its nucleus, as at Rocca Monfina, Astroni, &c.

Drawer 102.—Limestones and Dolomites ejected from Vesuvius.

Drawers 103, 104.—Variety of Vesuvian minerals.

Such as Meionite, Humite, Tourmaline, Comptonite, Wollastonite, Leucite, Mica, Apatite, Nepheline, Idocrase, Olivine, Melanite, Sodalite, Fer oligiste, Galena, &c.

Drawer 105.—Dykes with the rocks traversed by them, consisting of Leucitic porphyries very different from the present lavas of Vesuvius. Monte Somma.

Drawer 106.—Masses ejected from Monte Somma, and from the cone of Vesuvius.

Drawer 107.—Older lavas from Vesuvius, the date of which is not known.

These lavas have the same composition as those at present ejected, being intimate mixtures of two minerals, Labradorite and Augite.

Labradorite $RO, SiO_3 + Al_2O_3, SiO_3$,

Augite $3RO, 2SiO_3 - RO$ being either Lime, Magnesia, Protoxide of Iron, or Protoxide of Manganese.

By comparing this with the composition of trachyte or granite it will be seen, that the proportion of Silica is less, whilst that of the bases present is greater, than in the latter.

Drawers 108, 109.—Lavas from Vesuvius of known dates.

Amongst these are specimens of the currents of 1551, 1734, 1751, 1760, 1767, 1771, 1775, 1779, 1794, 1805, 1807, 1809, 1810, 1822, 1845, 1855, 1858.

Sublimations from Vesuvius.

Specimens of lava stamped while still hot.

Drawer 110.—Sublimations from Vesuvius.

For the contents of Drawers 96—110, consult "Volcanos," ch. 12.

Drawers 111—113.—Specimens from Ischia.

Including the trachyte and tuff with tertiary shells from Mount Thabor, the lava of Capo d'Arso, the tuff from the summit of Mount Epomeo, the pumice of Castiglione, and the salts which effloresce at the hot springs of the Island.

The lava of Capo d'Arso is more glassy than is the general case with those of Vesuvius. Hence it decomposes so slowly that no vegetation is found upon it, although it was ejected so long ago as 1302.

Drawers 114—116.—Suite of rocks from Mount Vultur and its neighbourhood.

Including the lava of Melfi with Hauyne, the lava and tuff of the volcano itself, and various masses ejected by it.

See Volcanos, ch. xi. and a memoir of mine in the Transactions of the Ashmolean Society. The mineral Hauyne is only found here, near Rome, and near Andernach on the Rhine. Its composition is $3\,CaO,\ 2\,Si\,O_3 + 2(Al_2\,O_3,\ Si\,O_3) + 2(K\,O,\ S\,O_3,)$ containing therefore a Sulphate of Potassa united with a Felspathic mineral.

Lipari Islands.

Drawer 117.—Pumice and tuff. Island of Lipari.

Drawer 118.—Obsidian and other allied rocks. Island of Lipari.

With them are placed, as points of comparison, specimens produced by artificial heat by Gregory Watt, which show the effect of slow and rapid fusion upon Basalt.

Sublimations from the Island of Volcano.

Including Boracic acid*, Sal Ammoniac and Sulphur.

N. B. This mineral (Obsidian) is closely allied to Pumice, as Abich's analysis shows:

* The only European locality for this substance, except the Lagoons of Tuscany, for which see Drawer 5, p. 4. B.

	The Obsidian of Lipari.	Pumice of ditto.
Silica	74.05	73.70
Alumina	12.97	12.27
Oxide of Iron	2.73	2.31
Lime	0.12	0.65
Magnesia	0.28	0.29
Soda	4.21	4.52
Potash	5.11	4.73
Chlorine	0.31	0.31
Water	0.22	1.22

so that these bodies may be regarded as different conditions of the same mineral. Obsidian indeed may be converted into a substance much resembling pumice, by the mere application of a strong heat. Its vitreous character is not simply due to rapid cooling, for if so, ordinary lavas would assume it, but is doubtless connected with the presence of a large proportion of alkali; why however the mineral should assume the spongy and fibrous form of pumice by simply heating it, is still I believe undetermined. It will be observed, that it approaches trachyte in chemical composition, for the Obsidian of Lipari is RO, $Si\,O_3 + R_2\,O_3$, $3\,Si\,O_3$, which is the composition of Albite; whereas Labradorite, which is the kind of felspar present in most lavas, is RO, $Si\,O_3 + R_2\,O_3$, $Si\,O_3$. It seems necessary therefore, that Silica should be present in sufficient quantity to form a trisilicate with the Alumina, and also that alkaline bases should exist in the mineral sufficient to combine with the remaining Silica, in order that a vitreous body like Obsidian should result from the fusion. See Volcanos, ch. ii, and Abich Geog. Beob.

Drawer 119.—Black pumice, scoriform and compact lava, specular iron ore, augite crystals, Stromboli.

Sicily.

Drawer 120.—Ejected masses from Mount Etna, and specimens of the older and more modern lavas.

Amongst the latter are specimens of the currents of 1669, 1679, 1842.

Similar in composition to the modern lavas of Vesuvius, but entirely different from those of the Lipari Islands.

Drawer 121.—Volcanic rocks from Mount Etna and from Graham's Island; Palagonite from Palagonia, Val de Noto.

Drawer 122.—Palagonite from Aci Reale, with Analcime and other imbedded minerals.

Palagonite is a name given by Waltershausen to the tuff of Sicily, Iceland, and elsewhere, from the town of Palagonia where he first observed it.

Its composition is $(3\,RO, 2\,Si\,O_3 + 2\,R_2\,O_3, Si\,O_3) + 9\,HO$.

Drawer 123.—Hippurite limestone of cape Passero, interstratified with volcanic tuff; and tertiary limestones of the Val de Noto, alternating with antient lavas.

For a description of this fossil see Owen's Palæontology, p. 64. As it is usually found in the chalk, it would seem that the volcanic rocks of the Val di Noto began to be formed in the cretaceous period, although they continued to be erupted during the tertiary epoch, as shown by the shells present in the strata which alternate with volcanic materials in other parts of this district. See also Geological Transactions, ii. 277.

Drawer 124.—Obsidian, pumice, and scoriform lava; double refracting spar, and siliceous sinter. Iceland.

Drawer 125.—Scoriform lava from St. Michael's, Azores, and from sundry other localities.

Drawer 126.—Obsidian and other volcanic rocks from Mexico and various parts of the Pacific Ocean.

PART IV.

MISCELLANEOUS SPECIMENS IN GEOGRAPHICAL SEQUENCE.

Rocks from North America.

Collected during a tour in the United States, 1837—1838.

See memoir on the Geology of North America, in Transactions of the Ashmolean Society.

Drawer 1.—Rocks from Quebec. Upper Canada.

Drawers 2, 3.—Rocks from the New England States, near Boston and Newhaven.

Drawer 4.—Impressions of plants in coal, and of birds' feet in sandstone, Massachusetts.
(Similar to the Dinornis found in New Zealand.)

Drawer 5.—Limestone with Trilobites, Orthoceratites, &c., from the falls of Niagara. New York State.

Drawer 6.—Limestone with Trilobites, some of great size, from the Trenton Falls. New York State.

Drawers 7, 8.—Serpentine and other rocks. Hoboken, New Jersey.

Drawers 9, 10, 11.—Rocks of Virginia, chiefly from the Blue Ridge.

Including a series taken at the anticlinal axis of the latter Ridge near the Warm Springs, illustrating the connection of thermal waters with lines of dislocation.

Drawer 12.—Rocks of Kentucky.

Drawers 13, 14.—Rocks from Cincinnati, Ohio.

With various fossils named by Mr. Lonsdale.

Drawers 15, 16.—Rocks from Missouri, and from Arkansas.

Including specimens of the magnetic iron ore found at the Iron Mountain, and of the rocks from the neighbourhood of the Warm Springs of Washita.

Drawer 17.

Drawer 18.

Drawer 19.

Drawer 20

Drawer 21.

Greece and the Levant.

These specimens were for the most part collected by Dr. Sibthorp, but are deprived of much of their interest owing to their labels being often lost or effaced. They are however preserved out of respect to the memory of the Collector.

Drawer 22.—Marbles from Mount Pentelicus. Attica.

Drawer 23.—Rocks from Hymettus, Mount Helicon, Attica, &c. Dr. Sibthorp.

Drawer 24.—Rocks from the Island of Imbros. Ditto.

Drawer 25.—Rocks from the neighbourhood of the Sea of Marmora. Ditto.

Drawer 26.—Rocks from Zante and other places in Greece. Ditto.

Drawers 27, 28, 29, 30, 31, 32, 33, 34.—Rocks and minerals from the Levant. Ditto.

Drawer 35.—Rocks from Transylvania. Ditto.

GERMANY.

Drawer 36.—Rocks from the neighbourhood of warm springs,—Wisbaden, Warmbrunn, Ems.

Drawer 37.—Ditto from those of Carlsbad.

Drawer 38.—Suite of specimens from Dillenburg in Nassau, consisting of slates, often jaspideous, and associated with porphyry.

Drawer 39.—Primary rocks from the Hartz, Saxony.

Drawer 40.—Rocks near Carlsbad, Bohemia.

Drawer 41.—Specimens from the quicksilver mines of Idria.

Drawer 42.—Laybach, Carinthia; Marburg and Grätz Styria.

Drawers 43, 44.—Miscellaneous. Germany.

Drawer 45.—Bones and fossils from the caves of Gailenreuth, Franconia.

See Dr. Buckland's Reliquiæ Diluv.

Drawer 46.

Drawer 47.

Drawer 48.

Drawer 49.

Drawer 50.

Drawer 51.

Drawer 52.

ALPS.

Drawer 53.—Rocks near Monte Rosa, Switzerland, and about Mont Blanc, Savoy.

Drawer 54.—Rocks from St. Gothard.

Drawer 55.—Rocks from various parts of Switzerland.

Drawer 56.—Rocks near Aix in Savoy, St. Gervais, and various parts of the Alps.

Drawer 57.

Drawer 58.

Drawer 59.

Drawer 60.

FRANCE.

Drawer 61.—Rocks from the Pyrenees.

Drawer 62.—Miscellaneous rocks from various parts of France.

Drawer 63.

Drawer 64.

Drawer 65.

Drawer 66.—Rocks chiefly Silurian, collected in 1852, during a tour in the Ringerigge, near Christiania.

Drawer 67.

SPAIN.

Specimens collected during a tour in that country in 1843.

Drawer 68.—Quartz rock and Silurian slates, with specimens of the Phosphorite rock which the latter contains. Logrosan, near Truxillo, Estremadura.

See my Paper in the Royal Agricultural Journal.

N. B. A complete suite of the Phosphorite rock may be seen in the glass case in the Sherard Room, where also are specimens of mineral phosphates from various other localities.

Drawers 69, 70.—Rocks near the quicksilver mines of Almaden in the Sierra Morena.

Drawer 71.—Rocks of various ages from Andalusia.

Drawer 72.—Tertiary rocks near Madrid, including specimens of the Meer schaum from Valegas.

Drawer 73.

Drawer 74.

Drawer 75.

Drawer 76.

Drawer 77.

B.

ITALY.

Drawer 1.—Tertiary rocks near Naples.

Drawer 2.—Ancient marbles from the ruins of Rome.

Drawer 3.—Rocks with specular iron ore, and other imbedded minerals from the Isle of Elba.

Drawer 4.—Rocks from the Pietra Mala and Borghetto, Apennines.

Drawer 5.—Rocks from the Lagoons,—Trap and Serpentine from Monte Cerboli, and deposits from petrifying springs, Tuscany.

Drawer 6.

Drawer 7.

Drawer 8.

Drawer 9.

Drawer 10.

Drawer 11.

Drawer 12.

Drawer 13.

Drawer 14.

Drawers 15, 16.—Fossiliferous Mesozoic Limestones and other rocks. Sicily. See also Drawer 38.

Drawers 17, 18.—Specimens, chiefly very small, from one of the Arctic expeditions.

(Bought at Dr. Buckland's sale,) consisting of 107 specimens of rocks from :—

Duke of York's Bay.
Winter Island.
Gore Bay.
Five Hawser Bay.

Amherst Island.
Fury and Hecla Strait.
Lidden Island.
Driskot Cove.

See Capt. Parry's three Arctic voyages.

Drawer 19.

Drawer 20.

Drawer 21.

Drawer 22.

Drawer 23.

Drawer 24.—Primary rocks from Jersey and Sark.

Drawer 25.—Primary rocks, from Guernsey.

Drawers 26, 27, 28, 29.—Veinstones and imbedded minerals. Cumberland.

Drawers 30, 31.—Miscellaneous. England and Wales.
Including a number of specimens of polished limestones.

Drawer 32.—Specimens of the materials which compose the vitrified forts of Ireland.
Depositions from various petrifying springs in England.

Drawer 33.—Concretions from the clay of Buckingham, from Mr. Stowe.

Drawer 34.

Drawer 35.

Drawer 36.

Drawer 37.

Drawer 38.—Specimens of the rock of Monte Pelegrino near Palermo.
Bones of Hippopotami and chipped Flints from the cave of St. Ciro, near Palermo, (too large to lie in their proper place in the Collection.)

N. B.—*The Fellows of the Society, as well as those Members who hold Demyships in Natural Science, may obtain Copies of this Catalogue by applying to the Prælector of Natural Philosophy, or to the College Librarian.*

Magdalen College, March 7, 1861.